

HOW TO MAKE A PENNY



AT THE DENVER MINT

A lot of people save pennies. Many more people just put them in a drawer and forget about them. That's too bad. Pennies are needed in the world of business. If all the forgotten pennies were brought out of hiding and used, it would save the mint a lot of time and money making more and more pennies every year.

The penny is our country's most popular coin. The Mint makes more pennies than any other coin. In fact, 76 percent of all coins made each year are pennies, of which about 40 percent are produced at Denver.

Pennies are made of two metals. They are 95 percent copper and 5 percent zinc. "Nickels" are also made of two metals. They are 75 percent copper but only 25 percent nickel. This alloy is called cupro-nickel.

All other coins are called composite coins because they are made in three layers. The outside layers are cupro-nickel and the middle layer is pure copper. Dimes, quarters and half-dollars all have three layers as does the new dollar coin first issued in the fall of 1971. The layers must be bonded together. This is called cladding.

The Act of April 2, 1792, provided for a national coinage and the establishment of the U.S. Mint. The first mint opened in Philadelphia and it was the first public building erected by the United States Government. The first coins made were pattern silver half dimes made by hand from silver belonging to George Washington. In 1793 copper cents and half cents were the first coins made for regular use.



Fig. A—MAKE-UP

The make-up box is weighed on a floor scale. It's called a make-up box because it holds the raw metal from which coins are made up. A big crane picks up the box and takes it to the melting furnace.

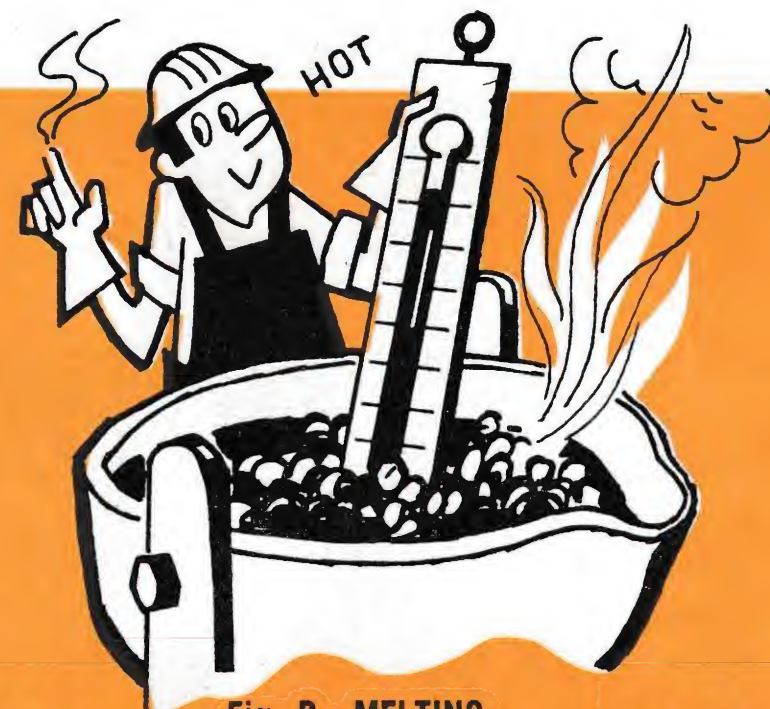


Fig. B—MELTING

The furnace is electric and gets red hot. When the metal is put inside the furnace it melts. The furnace is big enough to hold 15,000 pounds of metal.



Fig. C—CASTING

The melted metal is poured into a mold that looks like a giant candy bar. The bar is called an ingot. When the melted metal cools it gets hard again. The bar is about 18 feet long and weighs about 7,000 pounds.



Fig. D—CROPPING SAW

Each bar is cut in half. Now there are two bars. They are called slabs. Each one must be 8 and a half feet long and weigh 3,300 pounds. Any scrap is sent back to the furnace. Nothing is wasted.



Fig. E—REHEAT FURNACE

This is another electric furnace that heats the slab to just the right temperature so it will be soft enough to be rolled out.



Fig. F—ROLLING LINES

The slab is red hot and is six inches thick. Many things happen here:

First the slab squeezes through a pair of rollers. The rollers are so close together and press down so hard that when the slab comes out after several trips back and forth it is only one-half inch thick.

The rolled out slab is still red hot. It must be cooled to room temperature. Now it is sent through two sprays of water to cool it.

The top and bottom of the slab must be smooth. A machine shaves the top and bottom. The shavings go back to the melting furnace. The strip is now smooth and bright and so thin it can be rolled up into a coil.

Even though the coiled strip is very thin it is not thin enough. So the strip is uncoiled and put through a second rolling mill. When it comes out it is only a tenth of an inch thick.

When uncoiled the strip is about 400 feet long. Sometimes two or more of the uncoiled strips are welded together to make a strip even longer. Rough edges are trimmed off the strip to make it smooth. Now the coil is rolled down in the third rolling mill to one-twentieth of an inch thick, 15 inches wide.

Note: This brochure depicts the complete Philadelphia Mint coin-making process. Operations illustrated by Figs. G through K only, are performed by the Denver Mint.



Fig. K

INSPECTION, COUNTING AND BAGGING

At last we have a penny! Bad pennies are not allowed to leave the mint. Good pennies go to the counting machine. After 5,000 pennies fall into the bag a sewing machine sews the bag shut. The bags go to the Federal Reserve Bank. Then the pennies go to you.



Fig. J—COINING PRESS

The shiny golden penny blanks are ready to receive the impression of President Lincoln's portrait on one side and the Lincoln Memorial on the other. The designs are impressed from hard steel coinage dies onto the blank. Fingers on the press firmly grab each blank and one heavy blow stamps the design on each side.



Fig. I—UPSETTING MILLS

The blanks roll on their edges through this machine. They are soft enough so that when the machine presses on them it raises a rim around the blanks.



Fig. H

ANNEALING AND CLEANING LINES

The blanks are put into a gas furnace to be softened again. (Annealing means to soften). They come out of the furnace red hot and drop into water to cool. The blanks are then cleaned and polished. Then they are rinsed off with water and dried.



Fig. G—BLANKING PRESS

The strip is ready for punching out round pieces of metal about the size of a penny. They are called blanks, or planchets. This machine works just like a cookie cutter. After the blanks are punched out any strip left over is sent back to the make-up box.



The Denver Mint traces its history to the fall of 1862 when, for \$25,000, the United States government purchased the private mint of Clark, Gruber & Co. at 16th and Market Streets.

Although the Act of April 21, 1862, provided for the establishment of a Denver mint the facility first opened as an Assay Office. Its operations were restricted to melting, refining, assaying and stamping of gold bars as to fineness and weight which were formed from gold dust and nuggets brought in by miners in the surrounding area.

That was five years after Denver was founded in 1858, the year placer gold was discovered at the junction of the South Platte River and Cherry Creek, now the geographical center of the city. The following year lode gold was found. Colorado was organized as a Territory in 1861 and earned the nickname of the "Centennial State" in 1876 when, a hundred years after the signing of the Declaration of Independence, statehood was achieved.

In 1895 Congress approved a mint for the coinage of gold and silver. The Assay Office moved to its present structure in 1904 and in February of 1906 advanced to the status of a U.S. mint when coinage operations began.

During the first year of operation, the Mint turned out gold coin valued at 23.8 million dollars and silver coins valued at 3.2 million dollars. Coinage of five cent and one cent pieces began in 1911 and that year 12.6 million pieces were minted.

To meet the growing demand for coins, the present building was expanded in 1936, and new equipment installed to speed and perfect the manufacturing process. Again, in 1946 and 1965, new wings were added. Currently, private contractors supply the pre-fabricated coils of metal from which the coin blanks are punched. Operations at Denver are concentrated upon the blanking function (Fig. G), and the actual stamping of coins. Today, the Denver Mint is capable of producing over 1.25 million coins per hour.

Visitors are welcome at the Denver Mint. One of the highlights of the tour is a display of gold bars worth over \$1,000,000. Each bar weighs approximately 27½ pounds.

The Denver Mint is part of a nationwide Treasury Agency known as the Bureau of the Mint. From headquarters in Washington, D.C., the Director of the Mint administers the Philadelphia and Denver Mints, the Assay Office at New York City, the Assay Office and the Old Mint at San Francisco and the Depositories at Fort Knox, Ky. and West Point, N.Y. for the storage of gold, silver and other coinage metals.

